UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,426	12/03/2003	Dennis R. Simons	246079US6	4013

22850 7590 08/15/2005

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
HERRING, LISA L	

ART UNIT	PAPER NUMBER
1731	

DATE MAILED: 08/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

h

Office Action Summary	Application No.	Applicant(s)
	10/725,426	SIMONS ET AL.
	Examiner	Art Unit
	Lisa Herring	1731

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *06 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/26/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

lh

DETAILED ACTION

Specification

The objection to the abstract has been withdrawn due to the amendment filed June 6, 2005.

Claim Objections

1. The objection to the claims under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n) has been withdrawn due to the amendment filed June 6, 2005.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geittner et al. ("PCVD at High Deposition Rates, Journal of Lightwave Technology, Vol. LT-4, No. 7, July 1986) in view of Roba (4,608,070) and Davis (4,664,689). Geittner discloses a method of manufacturing an optical fiber by carrying out one or more chemical vapor deposition reactions in a substrate tube comprising:

i) supplying one or more glass forming precursors, which may or may not be doped, to the substrate tube; (pg. 818, Column 1, last paragraph)

ii) supplying a stoichiometric excess amount of oxygen to the substrate tube (pg. 818, Column 2, 1st paragraph),

iii) setting up a reaction in the substrate tube between the reactants supplied in steps i) and ii) so as to effect the deposition of one or more layers of glass on the interior of the substrate tube; (pg. 818, Column 1, 1st paragraph)

iv) subjecting the substrate tube thus coated in step iii) to a collapsing process so as to form a preform, and finally (pg. 818, Column 2, 2nd paragraph)

v) drawing the preform into an optical fiber while heating the preform (pg. 818, Column 2, 3rd paragraph)

vi) PCVD conditions where the pressure used ranges from approximately 10-25 mbar during step iii) (pg. 818, Column 1, 3rd paragraph)

Geittner fails to explicitly state the preform is heated during the drawing process. However, it is well known in the art in order to draw a glass preform into fiber, heating is required, as evidenced by Davis (Column 1, lines 39-45). Geittner also fails to specifically disclose the subsequent cooling of the optical fiber. However, Davis discloses a method and apparatus designed to cool fiber generally at 1000 °C in an optical fiber cooler in about 0.1 to 2.0 seconds (Column 4, lines 66-68) in order to decrease the temperature of the fiber to provide a uniform coating (Column 1, lines 39-45). Accordingly, it would have been obvious to one skilled in the art at the time the invention was made that while drawing the optical preform into fiber, in the process disclosed by Geittner et all, to heat the preform and to subsequently cool the optical fiber for the advantage of uniformly coating the fiber downstream.

Geittner also fails to explicitly disclose the Reynolds number is in accordance with the formula $120 < Re < 285$ during the deposition process according to step iii).

However, Geittner discloses the reaction takes place in the laminar flow range according to the Hagen-Poiseuille equation (pg. 819, Column 2, 2nd paragraph). Additionally, Geittner discloses the SiO_2 incorporation efficiencies were 100% and 80-90% for the dopants, (pg. 818, column 2, last paragraph, pg. 821, Column 2, 1st paragraph) and disclosed if the experimental parameters are below the lower limits given in Fig. 2 are chosen, the incorporation efficiency drops below 95%. (pg. 819, Column 1, 1st and 2nd paragraph) Since the applicant states on pg. 5, lines 21-28, the criticality of the Reynolds number is to ensure an incorporation efficiency of more than 90% and the stability of the plasma, it is inherent in the process disclosed by Geittner that the Reynolds numbers are within applicants stated formula of $120 < Re < 285$, since Geittner's incorporation efficiencies range from 80-100% and the plasma must be stable in order to produce the preform at such high incorporation efficiencies.

Alternatively, Roba discloses a deposition process in a substrate tube (abstract) where the deposition quality in terms of uniform dopant concentration, axial uniformity of deposited mass, and absence of localized imperfections is strictly dependent upon the flow of gases carrying the glass particles. Roba discloses such flow should be laminar conditions, specifically 500 or less (Col. 4 line 58) and hence must be limited to a finite range of values, which depend on the reactor type. Roba fails to specifically disclose the range of Reynolds numbers as recited in Claim 1. Therefore, since it is clearly suggested by Roba that laminar conditions are required in order provide good deposition quality and there is a range of finite values in the laminar range that depends on the reactor type, it would have been obvious to one skilled in the art at the time the

invention was made to optimize the Reynolds number, since it has been held that discovering an optimum value as a result effective variable only involves routine skill in the art. In re Boesch, 617 F. 2d 272,205 USPQ 215 (CCPA 1980).

Regarding claims 4 and 9, Geittner discloses the stoichiometric excess of oxygen is 4.0, which is within applicant's range in the claim of 1.8 – 5.0 (pg. 818 Col. 2 1st paragraph).

Regarding claims 5, 11, and 13, Geittner discloses the deposition process is a plasma chemical deposition process within a substrate tube, therefore it meets the limitations of the claim.

Regarding claims 7, 14, 16, and 17, Geittner discloses the deposition rate ranges from 0.5 to 3.0 g/min (pg. 181 Col. 2 1st paragraph), which overlaps the deposition rate of at least 2 g/min recited in the claims.

Claims 3, 6, 8, 10, 12, 15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geittner et al. ("PCVD at High Deposition Rates, Journal of Lightwave Technology, Vol. LT-4, No. 7, July 1986) in view of Roba (4,608,070) and Davis (4,664,689) as applied to claims 1 and 2 above, and further in view of Geittner et al. (5,188,648).

Regarding claims 3, 8, 10, 12, and 15, Geittner ("PCVD...) fails to disclose the temperature of the substrate tube during the deposition process ranges from 1000-1150°C. However, it is well known in the art the temperatures of the tube are typically 1000°C or greater, as evidenced by Geittner ('648). Geittner ('648) discloses a PCVD method utilizing a substrate tube with pressures ranging from 1 and 30 hPa (1 to 300

mbar) wherein the glass is deposited in layers on the inner wall of a glass tube by heating the tube to a temperature between 1100°C and 1300°C. This temperature range overlaps the applicant's range recited in the claims. Accordingly, it would have been obvious to one skilled in the art at the time the invention was made in the process of Geittner ("PCVD...") to use a temperature of 1000-1150°C during the deposition of the glass layers on the interior of the substrate tube, since it is well known in the art, as taught by Geittner ('648) (Abstract), which discloses in a PCVD method, glass is successfully deposited when the substrate tube temperature ranging between 1100°C and 1300°C.

Regarding claims 6 and 18, as discussed previously, Geittner ("PCVD...") discloses the deposition rate ranges from 0.5 to 3.0 g/min (pg. 181 Col. 2 1st paragraph), which overlaps the deposition rate of at least 2 g/min recited in the claim, but fails to disclose the plasma zone is moved with respect to the substrate tube during step iii). However, it is well known in the art to move the plasma zone, as evidenced by Geittner ('648). Geittner ('648) discloses during the deposition of glass in the substrate tube using a plasma process by reciprocating the plasma between the first and second reversal points inside the tube (Col. 4 lines 7-10). Accordingly, it would have been obvious to one skilled in the art at the time the invention was made in the process of Geittner ("PCVD...") to use a plasma zone moving with respect to the substrate tube during the deposition of the glass layers on the interior of the substrate tube, since it is well known in the art, as taught by Geittner ('648), which discloses in a PCVD method,

glass is successfully deposited while reciprocating the plasma zone between first and second points inside the tube.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 and 5 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 and 12, respectively, of copending Application No. 10/165,620 in view of Geittner et al. ("PCVD at High Deposition Rates, Journal of Lightwave Technology, Vol. LT-4, No. 7, July 1986) or alternatively in view of Roba (4,608,070). Claim 1 of Application No. 10/165,620 discloses all of the method steps of Claim 1 of Application No. 10/725,426 and Claim 12 of application No. 10/165,620 discloses all of the method steps of Claim 5 of Application No. 10/725,426. Both claims fail to specifically disclose that the Reynolds number is in accordance with the formula $120 < Re < 285$ during the deposition process according to step iii). However, Geittner discloses the reaction takes place in the laminar flow range according to the Hagen-Poiseuille equation (pg. 819, Column 2, 2nd paragraph).

Additionally, Geittner discloses the SiO_2 incorporation efficiencies were 100% and 80-90% for the dopants, (pg. 818, column 2, last paragraph, pg. 821, Column 2, 1st paragraph) and disclosed if the experimental parameters are below the lower limits given in Fig. 2 are chosen, the incorporation efficiency drops below 95%. (pg. 819, Column 1, 1st and 2nd paragraph) Since the applicant states on pg. 5, lines 21-28, the criticality of the Reynolds number is to ensure an incorporation efficiency of more than 90% and the stability of the plasma, it is inherent in the process disclosed by Geittner that the Reynolds numbers are within applicants stated formula of $120 < Re < 285$, since Geittner's incorporation efficiencies range from 80-100% and the plasma must be stable in order to produce the preform at such high incorporation efficiencies. Therefore, it would have been obvious to one skilled in the art the time the invention was made that the process disclosed by Claim 1 of copending application 10/165,620, could have used the flow rates, diameters, temperatures, and pressures as disclosed by Geittner, which includes the Reynolds numbers of the formula $120 < Re < 285$, for the advantage of obtaining incorporation efficiencies.

Alternatively, Roba discloses a deposition process in a substrate tube (abstract) where the deposition quality in terms of uniform dopant concentration, axial uniformity of deposited mass, and absence of localized imperfections is strictly dependent upon the flow of gases carrying the glass particles. Roba discloses such flow should be laminar conditions, specifically 500 or less, and hence must be limited to a finite range of values, which depend on the reactor type. Roba fails to specifically disclose the range of Reynolds numbers as recited in Claim 1. Therefore, since it is clearly suggested by

Roba that laminar conditions are required in order provide good deposition quality and there is a range of finite values in the laminar range that depends on the reactor type, it would have been obvious to one skilled in the art at the time the invention was made to optimize the Reynolds number, since it has been held that discovering an optimum value as a result effective variable only involves routine skill in the art. In re Boesch, 617 F. 2d 272,205 USPQ 215 (CCPA 1980).

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

5. Applicant's arguments filed June 6, 2005 have been fully considered but they are not persuasive.

6. In response to applicant's arguments that none of the cited references disclose or suggest a method of manufacturing an optical fiber where the Reynolds number is in accordance with the formula $120<Re<285$, specifically that Geittner teaches that the GeO_2 incorporation efficiency decreases from 85% to 62% if *m* is increased from 0.5 to 2.0 g/min if the temperature T_0 at the outer wall of the substrate is kept constant, therefore one of ordinary skill in the art cannot deduce the Re number as recited in present claim 1, is a critical value for the incorporation efficiency, is not found persuasive, since as stated in the rejection of claim 1 above, Geittner teaches the incorporation efficiency ranges Geittner's incorporation efficiencies range from 80-100%. Additionally, Geittner further goes on to state the decrease of incorporation efficiency on increasing deposition rate at constant substrate tube temperature T_o and constant speed of the microwave cavity v_0 may be compensated in part by a decrease

of T_0 by 40 K or by doubling the speed of the cavity to 2 v_o. Even though Geittner does not specifically disclose a Reynolds number, these changes will affect the Reynolds number, and since the incorporation efficiencies in the reference of Geittner disclose incorporation efficiencies of more than 90% and the stability of the plasma, it is inherent in the process disclosed by Geittner that the Reynolds numbers are within applicants stated formula of $120 < Re < 285$, since applicant states the Reynolds number is critical in order to obtain high incorporation efficiencies.

7. In response to applicant's arguments that none of the cited references disclose or suggest a method of manufacturing an optical fiber where the Reynolds number is in accordance with the formula $120<Re<285$, specifically that Roba does not teach the Reynolds number formula is not found persuasive, since Roba teaches deposition quality in terms of obtaining uniform dopant concentration, axial uniformity of deposited mass, and absence of localized imperfections is strictly dependent on the flow of gases carrying the glass particles. Further Roba discloses flow should be laminar conditions, specifically 500 or less, and hence must be limited to a finite range that depends on the reactor type. Roba has disclosed the flow conditions affect deposition, and as stated in the rejection of the claims above, the flow conditions are a result effective variable, and therefore, it would have been obvious to one skilled in the art at the time the invention was made to optimize the Reynolds number, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980). In response to applicant's argument that one skilled in the art could not find any hint in the Roba reference to use

a specific range of Reynolds numbers in order to obtain an SiO_2 incorporation efficiency of more than 90%, this is an argument against an individual reference, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Examiner has sufficienty shown motivation to combine Roba with Geittner, which discloses incorporation efficiencies, please see rejections above.

8. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's arguments, pertaining to the ODP rejection, that none of the cited references disclose or suggest a method of manufacturing an optical fiber where the Reynolds number is in accordance with the formula $120<Re<285$, specifically that Geittner and Roba fail to supplement this deficiency, please see rejections and argument above.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lisa Herring whose telephone number is 571-272-1094. The examiner can normally be reached on Mon-Fri. 7am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

L. Herring
Patent Examiner
Art Unit 1731.

Dionne A. Walls

DIONNE A. WALLS
PRIMARY EXAMINER